The OSI standard and the OSIRIDE network (1982-1992)

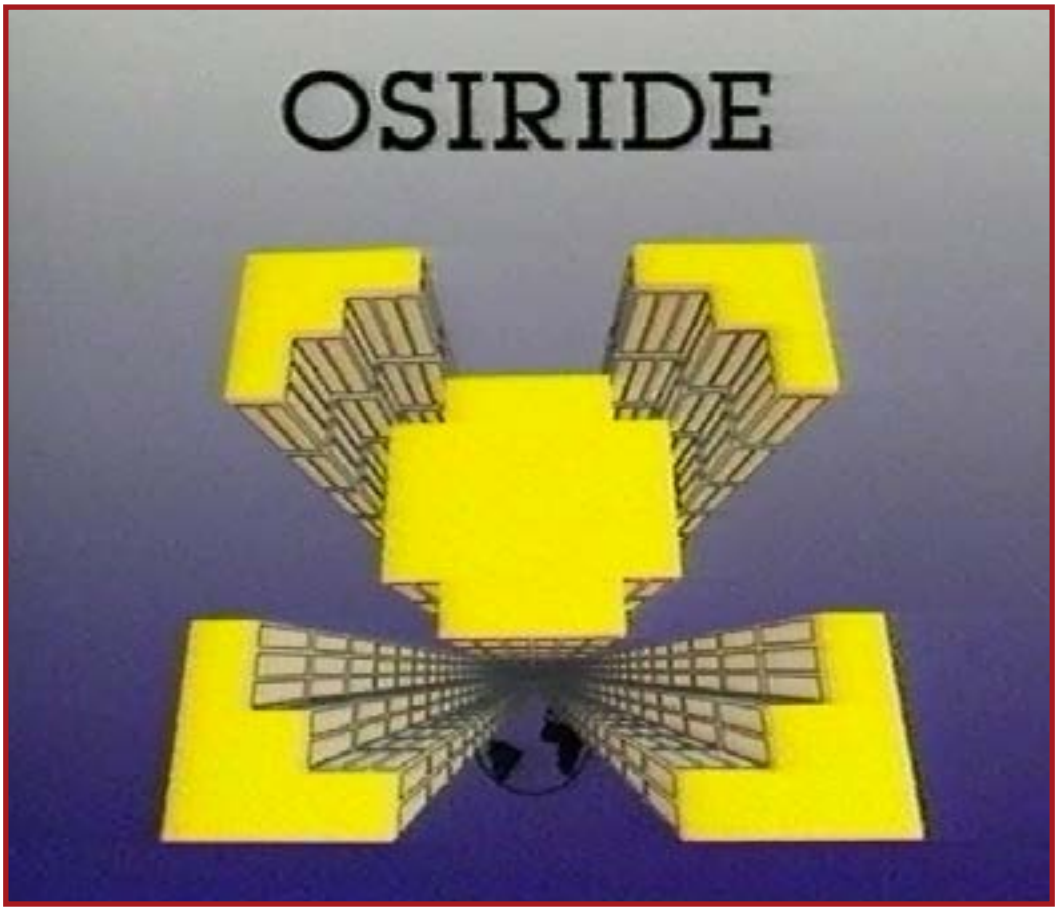
Luciano Lenzini tells the story

With RPCNET we had well and truly designed a network capable of bringing value to the whole CNR calculation system, and we had done it in an original and revolutionary way. Within a few years, however, the problem of its evolution was quickly posed. RPCNET's biggest limitation was in fact that it was created on IBM computers. This feature, in fact, totally excluded entry into the network of data centers with non-IBM computers. Furthermore, the RPCNET protocols were not compliant with the international OSI (Open Systems Interconnection) standards of the ISO (International Standards Organization). This was a consolidated architecture, alternative to the Internet, on which, by that time, there was almost unanimous consensus at a world level. This consensus was shared by both computer manufacturers and telecommunications operators. To overcome these limitations, the CNUCE made a proposal to the CNR to launch the OSIRIDE project (Italian OSIRIDE and British OSIRIDE) (OSI on Italian Heterogeneous Data Network) adopting the architecture of the OSI to interconnect the Italian CNR and University computing centers.

We are in 1982. It is worth noting that since 1976 (the year in which RPCNET was completed as a research project) a large group of CNUCE researchers had been actively cooperating internationally in defining the OSI architecture and protocols. OSI therefore seemed the most obvious decision, in line with the choices that many other European and non-European nations were about to make. Based on the needs of users in the Italian scientific world (well-known due to the RPCNET experience) and after contacting the builders of the computers installed in the CNR to sound out the availability of OSI products, the OSIRIDE team selected, for each level of architecture, the protocols deemed useful for the national scientific community. In particular, at the application level, the FTAM file transfer protocols and X.400 e-mail were chosen.

In addition to six manufacturers (Bull, Digital, Hewlett-Packard, IBM, Olivetti and Unisys), the company Tecsiel of the IRI-Finsiel group and SIP, the current TIM, also joined the OSIRIDE project. TECSIEL, based in Pisa with a branch of 150 employees, was specialized in the development of network protocols, while SIP had the responsibility of managing the national data network of that time, called ITAPAC. In particular, I like to recall that on 10 April 1984, as part of a ceremony held at the CNUCE, there was the signing by Prof. Ernesto Quagliarello (President of the CNR), Carlo De Benedetti (President of Olivetti) and Carlo Santacroce (President of Finsiel) of a collaboration contract for the development of the OSIRIDE software on Olivetti computers.

After some preliminary tests, the OSIRIDE team soon realized that the computers built for the OSIRIDE project could not talk with each other, even though the respective manufacturers had declared that their products were compliant with the OSI specifications. Each company, when questioned, ended up offloading responsibility onto their competitors. To overcome this rebounding of responsibility, which held back the development of OSIRIDE, it was decided to design and build a test center for the OSI products of the various manufacturers. As part of the OSIRIDE project, the OSIRIDE-Intertest initiative was born, with the aim of verifying the interoperability of OSI



products supplied by the six member manufacturers. The test log with which the OSI software was solicited was then automatically compared (using software tools) with the results foreseen by the OSI. Whenever a mismatch occurred, the builders' local teams intervened to try to solve the problem, often linked to a misinterpretation of the standard. Frequently, during the debugging phase, the manufacturers' OSI software development laboratories were heavily involved from their sites all over the world.

OSIRIDE was a truly global project that enabled CNUCE not only to consolidate but also to extend its visibility on networking issues.
In some cases, errors were even discovered in the standards whereby the CNUCE

reported them to the OSI standardization committees to make the necessary changes. It was astonishing to realize how OSIRIDE- Intertest helped to detect hundreds of bugs in OSI products released by manufacturers. The companies, before activating the project, were convinced that their software was perfectly compliant with OSI standards, as validated in their own test centers. None of the manufacturers ever wanted to make public the document describing the bugs discovered and CNUCE, which managed the document, strictly complied with this reuest.

Regardless of the results, the experience of OSIRIDE-Intertest proved to be invaluable for me and for my colleagues at CNUCE. The exquisitely technical environment, the sociable and collaborative atmosphere made every meeting with the technicians of the manufacturers extraordinary and fruitful in terms of trying to solve the problems locally as they appeared. In particular, the relationship between the Tecsiel laboratory in Pisa and the CNUCE OSIRIDE group was one of the most effective. It was exemplary due to its close cooperation, helped by the closeness of the sites, but mainly due to the common interests involved, despite the clear separation of tasks. These were tasks of technical scientific consultants and controllers, performed publicly within the CNUCE and of product developers for orders (often requiring very strict confidentiality) carried out at the Tecsiel laboratory.

For a few years the orders (entrusted by many manufacturers of computer systems worldwide) provided a substantial portion of Tecsiel's turnover. Furthermore, the collaboration enabled the rapid formation of a range of experts hired from recent Engineering and Science graduates of the University of Pisa.

In the second half of the 1980s, after the OSI software was thoroughly tested, the planning of the installations began in the various computer centers involved. However, towards the end of the decade and the beginning of the 90s, the spark of the Internet, until then confined to scientific and military circles, was set off and therefore quickly pervaded civil society. This led CNUCE,and therefore the CNR, to review its own networking policy. This meant discarding the OSI choice in favor of the Internet's TCP/IP.

Today the choice of OSI may seem nothing short of "extravagant" given the role of the Internet, but at that time there were very strong signs that it would become the architecture of a global network similar to the current Internet. There are even documents of the time (TCP_IP to OSI and rfc1169) that illustrate the attention with which DARPA followed the evolution of the OSI architecture, ready to make a migration if OSI had prevailed over TCP/IP. If this had happened, it would have been a completely different story for Italy. In that case, in fact, the OSIRIDE project would have catapulted us into the first group, worldwide, to have an operating network using the OSI standard. Proof of this is the fact that the Cooperation for Open Systems Interconnection, the largest OSI world organization made up of all computer manufacturers, included OSIRIDE in the list of the six most important OSI projects worldwide.